

Control of wheat-induced lactic acidosis in sheep by thiopeptin and related antibiotics.

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Thiopeptin, thiopeptin-like antibiotics and penicillin were shown previously to be highly active in vitro against *Streptococcus bovis*, the microorganism believed to be responsible for the initiation of ruminal lactic acidosis. The purpose of this work was to determine the efficacy of these antibiotics in preventing lactic acidosis in lambs challenged by intraruminal administration of ground wheat. Lambs, which were fasted and then given ground wheat at 40 g/kg body weight, showed dramatic increases in rumen and plasma lactate over the 30-hr experimental period. Rumen lactate increased from .2 to peak levels of approximately 150 mumoles/ml by 8 to 10 hr after wheat administration. Plasma lactate increased after rumen lactate was elevated and lambs succumbed when plasma levels exceeded 15 mumoles/ml. Ruminal volatile fatty acids were greatly reduced as rumen lactate increased. Over half of the lambs given ground wheat died within 30 hours. Thiopeptin given as a single dose completely prevented lactic acidosis by reducing rumen lactate 80 to 90%. In addition, thiopeptin permitted "normal" rumen fermentation to continue as indicated by a significant increase in volatile fatty acids. The minimum effective dose of thiopeptin to control acute lactic acidosis was .18 mg/kg body weight. Other members of the thiopeptin class, including sulfomycin, sporangiomycin, siomycin and taitomycin, prevented lactic acidosis in a manner similar to thiopeptin. Penicillin, however, inhibited ruminal volatile fatty acid production as well as lactate synthesis. In addition, the effective period for penicillin in the rumen was only 8 to 16 hr, after which lactate fermentation was reestablished. Thus, thiopeptin and thiopeptin-like antibiotics, but not penicillin, appear to provide prophylactic treatment against lactic acidosis in sheep.

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